

REMARKS

Claims 1-12 are pending in the present Application. Claims 3, 8, and 11 have been canceled, Claims 1, 5, and 6 have been amended, and no claims have been added, leaving Claims 1, 2, 4-7, 9, 10, and 12 for consideration upon entry of the present Amendment.

Amendments to Claims

Claims 1, 5, and 6 have each been amended to include limitations of Claims 3, 8, and 11, canceled herewith, in which the limitation “wherein the separator is partially coated with a gel polymer in which coated or non-coated areas form a pattern” is a clarification of the original limitation “wherein the separator has a gel polymer-coated part and a non-coated part patterned in a regular shape” of the canceled claims, amended to clarify the meaning of the term “regular shape”. Support for these amendments to specify that “patterned in a regular shape” means that the coated and non-coated areas form a pattern can be found in the Specification as filed at least on p. 7, lines 8-17, and p. 8, lines 3-24 in which an exemplary transfer patterning by a gravure method is described.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 3 and 11 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner considers the term “regular shape” to lack definite boundaries, and has interpreted “regular shape” to mean “any shape” for purposes of examination.

While Claims 3 and 11 have each been canceled, and the limitations thereof have been incorporated into Claims 1, 5, and 6; and have further been revised to clarify the meaning of “regular shape” to mean “pattern”. Support for this amendment can be found in the Specification and claims as originally filed.

The claims should now be acceptable to the Examiner in view of these amendments. Reconsideration and withdrawal of the rejections to the term “regular shape”, based on these

amendments, is respectfully requested.

Claim Rejections Under 35 U.S.C. § 102(b)/103(a)

Claims 1-3, 5-8, 10 and 11 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as allegedly unpatentable over, U.S. Patent No. 5,853,914 (“Kawakami”). It is noted that Claims 4, 9, and 12 appear to have been inadvertently omitted from the listing of rejections in section 7 of the Office Action dated 6/26/09, and have not been expressly rejected as either anticipated or unpatentable; in the Office Action, the Examiner appears to treat these claims as obvious (see section 7, p. 4, last two lines). Applicants accordingly will address these claims as being allegedly unpatentable.

Claims 1-3, 5-8, 10, 11 and 12 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as allegedly unpatentable over, U.S. Patent Application Publication No. 2002/0187401 (“Lee”). It is noted that Claims 4 and 9 have been completely omitted from the listing of rejections in section 8 of the Office Action dated 6/26/09, and have not been expressly rejected as either anticipated or unpatentable at all in the Office Action. Applicants accordingly assume these claims to be free of the cited art (Lee). If this is an incorrect assumption, Applicants request the Examiner correct the record and advise Applicants at the earliest possible date.

Applicants respectfully traverse these rejections.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, or knowledge generally available in the art at the time of the invention, must provide some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). “A patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007). To find obviousness, the Examiner must “identify a reason that

would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does.” *Id.*

Claims 1 and 5 claim a battery separator coated with a gel polymer over 40-60% of its area where the separator is partially coated with a gel polymer in which coated or non-coated areas form a pattern. It has been noted in the background that laminated structures can improve the close contact between an electrode and a separator; however, some features of a battery, such as rapid impregnation of an electrode with an electrolyte, uniform wetting of an electrode with an electrolyte, and a high-rate discharge property, can deteriorate as a result. See Specification, p. 2, line 11 to p. 3, line 12. It has unexpectedly been found that the above-mentioned problems occurring in the prior art are a result of the fact that gel polymer hinders an electrode from being impregnated with an electrolyte.

Accordingly, the claimed invention overcomes these problems with electrolyte impregnation, and provides a rechargeable lithium battery, in which an electrode can be totally impregnated with an electrolyte in a rapid and uniform manner, while uniform and close contact between the electrode and a separator is maintained.

Thus, the claims are distinguishable over the prior art at least in that the separator is not totally, but partially coated with a gel polymer, which provides a path for the permeation of an electrolyte to the separator.

As to the anticipatory and obviousness rejections of Claims 1-3, 5-8, 10 and 11 over Kawakami, Kawakami discloses a rechargeable lithium battery including a pressure means which is pressing an anode and a cathode. Herein, the pressure means may comprise a polymer gel (304) held on a support member (305) (see Fig. 3D).

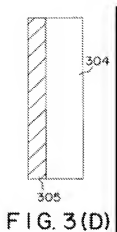


FIG. 3(D)

The pressure means of FIG. 3(D) is formed by casting a solution of an appropriate polymer onto the surface of an appropriate support member and the resultant is subject to crosslinking to convert a polymer or monomer (cast from solution) to a crosslinked polymer gel material. Col. 7, lines 34-53. Kawakami discloses that layer 304 of pressure means of FIG 3(D) may be formed to impregnate pores in the support 305 with the polymer gel material ("pore present in the support member are filled by the polymer gel material"). Col. 8, line 64 to Col. 9, line 3.

Kawakami fails to disclose all elements of the instant claim 1 and its dependents, and cannot anticipate the claim. Claim 1 claims that the gel polymer is formed in a pattern on a substrate. Kawakami fails to disclose the formation of a pattern in allegedly corresponding layer 304. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*" *Verdegaal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the *** claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Kawakami fails to disclose the element of a patterned gel polymer and hence fails to teach all elements of the instant claims, and therefore cannot anticipate the claims.

In addition, as this is a 102/103 rejection, Applicants contend that the limitations of Claim 1 would also not be inherent to the disclosure of Kawakami. In order to support an anticipation rejection based on inherency, an Examiner must provide factual and technical

grounds establishing that the inherent feature necessarily flows from the teachings of the prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int. 1990); *In re Oelrich*, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981) (holding that inherency must flow as a necessary conclusion from the prior art, not simply a possible one). The methods of coating disclosed in Kawakami do not disclose the formation of patterns on a substrate, but only methods which would provide a uniform coating (casting, powder coating, etc.) Further, Kawakami clearly discloses filling of free pores in the substrate 305 by the gel polymer layer 304 which one skilled in the art will recognize as effecting both a complete and thorough coverage of a surface, where the gel polymer interpenetrates with the substrate. Kawakami is silent as to pattern formation in a gel polymer layer. One skilled in the art will appreciate that as such processes tend to teach complete coverage, they do not teach that a pattern would necessarily form. Applicants in fact contend that based on the teachings of Kawakami, there is little probability that anything other than a complete and uniform coating would be formed. Therefore, there is no indication that the limitation of a patterned gel polymer layer would be inherent to the disclosure of Kawakami.

As to the obviousness rejections over Kawakami, the latter fails to provide a suggestion or incentive that would lead one skilled in the art to modify Kawakami to provide a patterned gel polymer layer. Kawakami is silent as to a patterned gel polymer layer, and hence fails to render the claims prima facie obvious. Further, Kawakami teaches methods of deposition that would not produce a patterned layer. *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989) (“Although the Commissioner suggests that [the structure in the primary art reference] could readily be modified to form the [claimed] structure, “[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification”) (citation omitted); *In re Stencel*, 828 F.2d 751, 755, 4 U.S.P.Q.2d 1071, 1073 (Fed. Cir. 1987) (obviousness cannot be established “by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion that the combination be made”). In a rechargeable lithium battery having the structural characteristics claimed in the instant claims, a path for discharging gases generated from electrode reactions can be provided, and thus, it is possible to prevent the gases from being trapped between each electrode and a separator so

that an electrode assembly is maintained in a stable form. Therefore, it is possible to prevent premature deterioration of electrodes, thereby improving the battery life. Kawakami is silent as to this feature. There is therefore no teaching or suggestions to combine elements of the prior art to produce the present invention. The present invention is thus nonobvious.

Reconsideration and withdrawal of the anticipatory and obviousness rejection of the instant independent Claims 1 and 5 and dependent claims over Kawakami, and allowance of the claims, are respectfully requested.

As to the anticipatory and obviousness rejections of Claims 1-3, 5-8, and 10-12 over Lee, Lee discloses a multi-component composted film used for a polymer electrolyte for electrochemical devices. The multi-component composted film is structure such that a porous gellable polymer layer is formed on one side or both sides of a polymer support layer film. Lee, Abstract. The polymer support layer and the gellable polymer are united without an interface due to interdiffusion of the gellable polymer into the support film. Lee, [0026]. The gellable polymer support layer is formed by either coating the polymer support with gellable polymer solution or by applying the gellable polymer solution to a release paper, drying, and applying to a polymer film, then heat setting. Lee, [0042].

Lee fails to disclose a patterned gel polymer film, and therefore fails to disclose all elements of instant Claims 1 and 5, and cannot anticipate these claims.

Further, as in Kawakami, Lee does not disclose the formation of patterns on a substrate, but only discloses methods which would provide a uniform coating (casting from solution or transfer by tape release) Further, Lee clearly discloses filling of pores in the polymer film by the gellable polymer layer which one skilled in the art will recognize as effecting both a complete and thorough coverage of a surface, where the gel polymer interpenetrates with the substrate. Kawakami is silent as to pattern formation in a gel polymer layer. One skilled in the art will appreciate that as such processes tend to teach complete coverage, they do not teach that a pattern would *necessarily* form. Applicants in fact contend that based on the teachings of Lee, there is little probability that anything other than a complete and uniform coating would be formed. Therefore, there is no indication that the limitation of a patterned gel polymer layer would be inherent to the disclosure of Lee.

Reconsideration and withdrawal of the anticipatory rejection of the instant Claims 1 and 5 over Lee is respectfully requested.

As to the obviousness rejections of these claims over Lee, Lee fails to teach all elements of the instant claims and therefore fails to provide a prima facie case of obviousness. Further, Lee fails to provide a suggestion or incentive that would lead one skilled in the art to modify Lee to have a pattern. *In re Laskowski*, Id. Lee discloses forming a coated surface with interpenetration of the gellable polymer into a polymer substrate, but does not disclose inclusion of a pattern over 40-60% of the surface of the substrate. In a rechargeable lithium battery having the structural characteristic as described in the instant claims however, a path for discharging gases generated from electrode reactions can be obtained from the patterning, and thus, it is possible to prevent the gases from being trapped between each electrode and a separator so that an electrode assembly is maintained in a stable form. Therefore, it is possible to prevent premature deterioration of electrodes, thereby improving the battery life. Lee is silent as to this feature. There is therefore no teaching or suggestions to combine elements of the prior art to produce the present invention. The present invention is thus nonobvious.

Reconsideration and withdrawal of the anticipatory and obviousness rejection of the instant independent Claims 1 and 5, and dependent claims over Lee, and allowance of the claims, are respectfully requested.

Thus, in summary, both Kawakami and Lee disclose a simple lamination or coated structure of a polymer gel on the support member or the polymer support layer film, and each fails to disclose a patterned polymer gel layer; and, each fails to provide a suggestion or incentive to modify Kawakami or Lee to include a patterned polymer gel layer.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise,
please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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